

STATUS OF THE ELECTRICITY SECTOR

This review updates the status of U.S. reconstruction projects to rebuild Iraq's infrastructure for generating, transmitting, and distributing electricity. SIGIR makes the following observations about progress over the last quarter in the electricity sector:

- By the end of the quarter, 44% of planned projects in this sector were complete,²⁰⁵ and 48% of the allocated dollars had been expended. More than \$700 million of the \$4.22 billion are still left to be obligated (See Figure 2-26). In addition, 1 nationwide project has been completed, and 33 nationwide projects are currently ongoing in the electricity sector.
- The current predicted completion date for all GRD-PCO projects in this sector is January 2008. However, at current rate of expenditures, actual completion by this date will not be met.
- IRRF-funded U.S. electricity projects have contributed 2,710 megawatts (MW) to Iraq's generation capacity. Overall genera-

tion capacity available to the grid, however, is currently below the estimated pre-war level—4,004 MW currently, compared to 4,500 MW before the war.

- For the week ending March 28, 2006, the average load served was 91,092 megawatt hours (MWH). Last year, during this same time period, the average was 86,700 MWH.
- On average, Iraqis outside of Baghdad are now receiving more hours of power than they did before the war. In Baghdad, there is less power (eight hours a day) than before the 2003 conflict. However, pre-war power distribution emphasized Baghdad's needs over the rest of the country.
- Slow progress in this sector can be attributed to many of the same challenges as found in other sectors: security, increased demand caused by growth and subsidies, widespread pre-war deterioration in the sector, corruption and theft, poor equipment operation and maintenance, and fuel shortages.

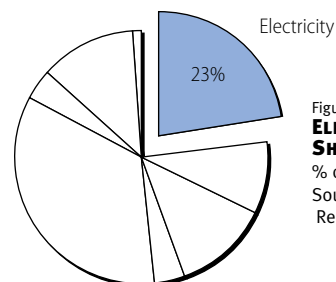


Figure 2-24
ELECTRICITY SECTOR AS A SHARE OF IRRF FUNDS
 % of \$18.439 Billion
 Source: DoS *Iraq Weekly Status Report*, 03/29/06



Figure 2-25 shows reconstruction activity in this sector by governorate.

IRRF-funded Activities in the Electricity Sector

Only 58 projects in this sector (9.6%) have yet to begin,²⁰⁶ and 44% are complete. To date, 63 design/build (D/B) projects valued at \$758 million have been completed and are operational. The 51 ongoing D/B projects valued at \$496 million are expected to be completed by June 2007.²⁰⁷ All GRD-PCO projects in this sector will be completed by January 2008.²⁰⁸

During the reporting period, \$240 million was disbursed in this sector—an increase of 67% from last quarter's \$144 million. More than 80% of the sector's funding has been obligated, and nearly half (48%) of the funding has been expended. Figure 2-26 shows the status of funds in the electricity sector, as of March 29, 2006.

Key Projects Completed and Underway

The U.S. reconstruction program in the electricity sector has three major types of projects:

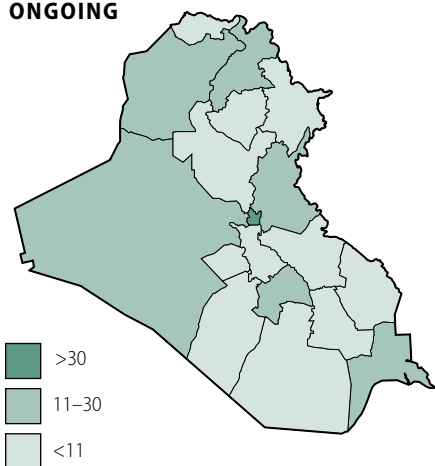
- *Generation facilities*, which produce capacity for the power system
- *Transmission networks*, which carry that power throughout the country
- *Distribution networks*, which deliver the transmitted power to local areas, homes, and businesses

GENERATION

One of the largest IRRF-funded generation projects, the Al-Doura power plant, will add 280 MW to the power grid and serve more than 1.5 million people in the Baghdad area.²⁰⁹

Khor Al Zubayr power plant, the other large power-generation facility constructed with IRRF 2 funds, was completed at the end of last

ONGOING



COMPLETED

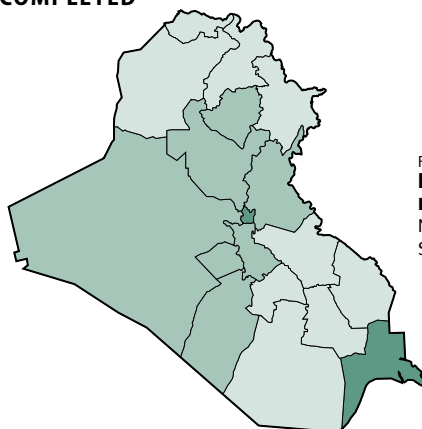


Figure 2-25
**ELECTRICITY PROJECTS
BY GOVERNORATE**
Number of Projects
Source: IRMS—IRMO Rollup File, 03/31/06

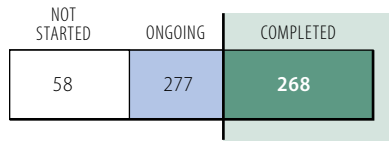


Figure 2-27

STATUS OF ELECTRICITY PROJECTS

Number of Projects

Source: IRMS—IRMO Rollup File, 03/31/06



Planned (603)
\$2.83B

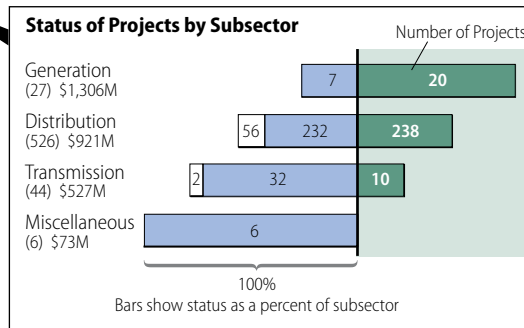
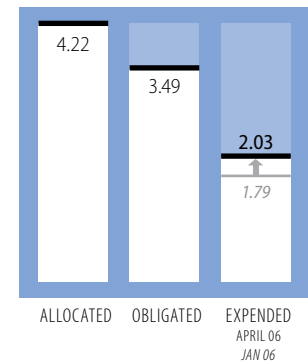


Figure 2-26

STATUS OF ELECTRICITY FUNDING

\$ Billions

Source: DoS Iraq Weekly Status Report, 03/29/06



quarter, and the plant is now operational. It is supplying 250 MW of power for the 1.5 million residents of Basrah.²¹⁰

GRD-PCO completed the refurbishment of a turbine at the Nassiriyah power plant, restoring 28 MW of generation capacity at a cost of \$21 million.²¹¹ Additionally, GRD/PCO completed the refurbishment of three gas turbine units, restoring 64.5 MW at the Petrochemical Power Plant.²¹²

As the construction component of the power generation program wraps up, the focus is now on improving Iraq's capacity to maintain the plants and continue to develop the sector independently. The execution of the newly awarded long-term Operations and Maintenance (O&M) support contract is critical to preventing the deterioration of the power generation plants.

TRANSMISSION

During this reporting period, \$305 million of deferred funds were reinstated to the sector to fund transmission projects in Iraq. This funding will be used to build substations and to supplement existing overhead lines.²¹³ Eleven transmission projects were started this quarter.²¹⁴

DISTRIBUTION

GRD-PCO reports that 46 distribution projects were completed this quarter, and 42 distribution projects started.²¹⁵ During this quarter, SIGIR conducted an assessment of the \$3.4 million Erbil City Transformer project. The SIGIR team observed good construction, effective project management, and adequate



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sustainment efforts at the project site. If work continues in this fashion, the team concluded that the project will improve electricity service in the area. For a summary of the assessment, see Section 3 of this Report.

The Outputs of IRRF-funded Electricity Projects

The outputs of U.S. electricity projects are measured by generation capacity added in megawatts. U.S. reconstruction projects have contributed more than 2,700 MW of generation capacity. When all projects are complete, the

United States is expected to have contributed more than 3,700 MW of generation capacity.

Despite the success of U.S. projects, generation capacity now falls below the pre-war level and the goal for summer 2006. Table 2-9 shows the estimated pre-war level and summer goal compared to the current level. It is important to note that the current status of 4,004 MW provides only a snapshot, and production can be influenced by many factors, including weather, security problems, and system maintenance. Table 2-10 compares the summer 2006 goal for generation capacity with cur-

CURRENT ELECTRICITY GENERATION CAPACITY VS. PRE-WAR LEVEL (Megawatts)

OUTPUTS METRIC	PRE-WAR LEVEL AS OF MARCH 2003	IRAQ GOAL FOR JULY 2006	CURRENT STATUS AS OF MARCH 28, 2006
Generation Capacity	4,500	6,000	4,004

Sources: Pre-war Level: UN/World Bank Joint Iraq Needs Assessment, 2003, p. 28. Note: GAO recently reported the pre-war level as 4,300 MW (GAO Report 06-697T, April 25, 2006, p. 19).
Goal: Joint U.S.-Iraqi Electricity Action Plan, March 12, 2006, p. 2.
Current Status: IRMO, Weekly Status Report, March 28, 2006.

TABLE 2-9

ELECTRICITY GENERATION PROJECT OUTPUTS

IRAQ GOAL FOR JULY 2006	CURRENT U.S. CONTRIBUTION, AS OF MARCH 31, 2006	CURRENT U.S. CONTRIBUTION AS A PERCENTAGE OF JULY 2006 GOAL, AS OF MARCH 31, 2006	TOTAL PLANNED U.S. CONTRIBUTION
6,000 MW	2,710 MW	45%	3,710 MW

Sources:
Goal: Joint U.S.-Iraqi Electricity Action Plan, March 12, 2006, p. 2.
Current Status: IRMO, Weekly Status Report, March 14, 2006.
Current and Total U.S. Contributions: SIGIR Data Call from DoS/NEA-I, March 24, 2006.

TABLE 2-10



rent U.S. contributions and the U.S. goal for contributions.

Outcomes of IRRF Projects

During this reporting quarter, the “hours of power per day” increased by several hours to exceed pre-war levels countrywide. In Baghdad, this metric continues to lag behind pre-war levels, in part because of a strategic

decision to provide power more equitably throughout the country. Current hours of power per day in Baghdad have been rising to near the 2006 Iraqi goal supported by the U.S.-Iraqi Joing Electricity Action Plan.

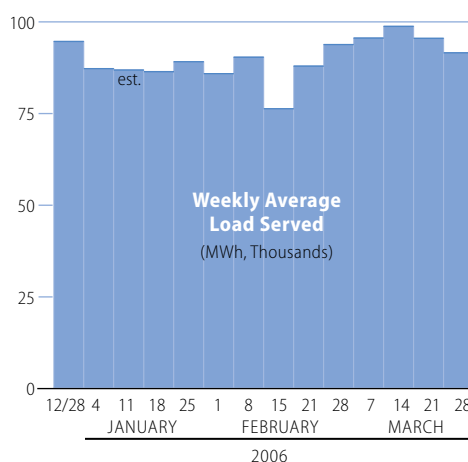
A comparison between the current load served and the same quarter last year shows that the load served has increased: for the week ending March 27, 2005, load served was 86,700 MWh.²¹⁶ Load served averaged 91,092 MWh per day for the week ending March 28, 2006.²¹⁷ However, this is well below the goal of 110,000 MWh.²¹⁸ Figure 2-28 shows the weekly average load served during this quarter.

Table 2-11 demonstrates the outcomes of U.S. projects in relation to the pre-war levels.

Challenges

SIGIR continues to examine the challenges in this sector reported during last quarter’s Report, including rising demand that now exceeds generating capacity. This quarter, SIGIR also looked at O&M in the electricity sector. Other challenges include the lack of a centralized monitoring and control system and a shortage of fuels to operate power plants.²¹⁹

Figure 2-28
ELECTRICITY LOAD SERVED
Megawatt Hours (MWh)
Source: IRMO Weekly Status Reports, 12/28/05–03/28/06



CURRENT OUTCOMES VS. PRE-WAR LEVEL AND GOALS

OUTCOME METRIC	PRE-WAR LEVEL	IRAQ GOAL FOR JULY 2006	CURRENT STATUS AVERAGE OF WEEK ENDING 3/28/06
Iraq Hours of Power/Day	4-8	12	16
Baghdad Hours of Power/Day	16-24	12	8

Sources:

Pre-War level: Department of State Briefing by U.S. Embassy Baghdad, November 30, 2005.

Goals: Joint U.S.-Iraqi Electricity Action Plan, March 12, 2006, p. 2.

Current Status: IRMO, Weekly Status Report, March 28, 2006.

TABLE 2-11



The deteriorated infrastructure in Iraq continues to affect reconstruction efforts in the sector. Infrastructure security also remains a problem. Security in the electricity sector was the subject of SIGIR Audit 06-009, which reviewed the Task Force Shield programs to protect the electric and oil infrastructure. The electricity component of this security program—EPSS—was found to be unsuccessful and “barely got started before it was cancelled.”

ISING DEMAND

Demand for electricity in Iraq continues to outstrip the total generation capacity by more than 60% (6,429 MW demanded vs. 4,004 generation capacity).²²¹ Thus, generators are commonly used in Iraqi homes to make up for the shortage. DoS estimates that private generators provide up to 2,000 MW of generating capacity.^{2-z}

The surge in demand from pre-war levels stems from a growing economy, fueled by Iraqi purchases of new appliances and electronics and by the subsidized prices charged for electricity by the Iraqi government. According to the World Bank, Iraqis pay less than one cent per kilowatt-hour.²²² This is much lower than rates in other countries in the region: Iranians, Jordanians, and Syrians pay 1.5 to 5 cents per kilowatt-hour.²²³ The artificially low rate provides little curb on demand.

Electricity revenues in Iraq also suffer from a collection rate of less than 30%,^{221a} partly



Electricity transmission tower

because of inoperable meters and the dangerous work environment.²²⁵ The “collection of revenue is the best method to encourage the efficient use of electricity and thereby reduce the total usage.”²²⁶

The supply shortage has ramifications for every key infrastructure sector. Water supply stations often require on-site generators to operate. And the oil sector would virtually shut down without power because pump stations, refineries, and injectors cannot function without electricity.



OPERATIONS AND MAINTENANCE

SIGIR continues to examine the O&M problem in the electricity sector, where estimates are that the lifespan of a generator in Iraq is 10-25% of the lifespan of properly maintained equipment.²²⁷ The joint action plan for electricity from IRMO and the Iraqi government calls for an increase in generation capacity of 854 MW by July 2006, which will be achieved through new O&M projects and programs.²²⁸ The United States is partnering with the Iraqi government to implement a comprehensive O&M plan.²²⁹ This \$80 million program is part of the joint action plan and will develop the technical capacity of Iraqis, which is vital to the sustainability of the electricity system. The program includes:

- on-site training and mentoring at eight sites
- communication, control, and monitoring of power plants
- training on gas turbine technology²³⁰

The U.S. government and the Iraqi Ministry of Electricity are concentrating on securing the sustainable operations of completed generation facilities in order to maximize power generation for the summer. The Ministry of Electricity and U.S. government have developed, and are beginning to implement, a coordinated sustainability plan that includes the execution of improved inspections, provision of spare parts and consumables, and regular maintenance for plant equipment. The production of electricity in Iraq will decline unless the plan's objectives are realized and incorporated into the daily operation of Iraqi-controlled facilities.²³¹

